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FOREST PLANTING LEAFLET.

COTTONWOOD (Populus deltoides).

FORM AND SIZE.

The cottonwood is naturally a tall, straight tree, and under favorable conditions may attain a height of 75 to 100 feet and a diameter of 2 to 3 feet. When grown in the open or in single rows it develops a large, wide-spreading crown and a short, heavy stem. In dense stands, however, the crowns become narrow and oblong and the stems long, slender, and free from branches.

The Carolina poplar, which is considered a horticultural variety of the common cottonwood, is widely used as a shade tree. It is not easily distinguished from the true cottonwood.

RANGE.

The eastern boundary of the natural range of cottonwood extends from central Quebec southward through northwestern New England, western New York, and western Pennsylvania; thence, south of the Potomac River, through the Atlantic States to western Florida. The western boundary extends from southern Alberta, in Canada, southward along the Rocky Mountains to northern New Mexico.

The cottonwood occurs usually in pure stands or in mixture with willow and other moisture-loving trees. On soils of the flood plains of the Mississippi River in western Kentucky and Tennessee, which are especially favorable, it forms a part of the mature hardwood forests.

For economic planting the range is confined to regions throughout the Middle West where there is a permanent supply of water near the surface.

HABITS AND GROWTH.

The most favorable site for cottonwood is the alluvial soil along water courses, for the most important factor in its growth and development is the available moisture in the soil and not the fertility. Forest plantations of cottonwood require a situation in which the water table is within 10 to 15 feet of the surface. Individual trees or single rows, however, on account of their extensive root system, can maintain themselves in drier situations. So many failures have resulted from attempts to establish cottonwood groves on upland soils that it is usually considered impossible to grow the tree except in rows along highways and similar places. So planted, the trees are valuable for windbreaks and give good returns in fuel and repair material. However, more satisfactory results will be secured by planting in permanently moist situations if production of lumber is desired.

Abundant light is required for development, and young stands tend to become thin. The crown cover is frequently so sparse that grass and shrubs come in under the trees and check growth. This drawback can be prevented by underplanting the grove with shade-enduring trees.

Growth in early life is very rapid. Small trees in a single year may increase from 3 to 5 feet in height and from 1 to 3 inches in diameter. Between the ages of 10 and 15 years the rate of growth gradually lessens, and under certain conditions maturity is soon reached.

Cottonwood is comparatively free from insect pests, though leaf insects occasionally do serious damage. In case of severe attacks application should be made to the Bureau of Entomology of the Department of Agriculture for information in regard to methods of control.

ECONOMIC USES.

The wood of cottonwood is light and soft. It is not strong, and it decays rapidly in contact with the soil. Regional factors of climate and soil cause marked differences in quality. In western Kentucky and Tennessee, for instance, the so-called yellow cottonwood furnishes a much better grade of wood than in the Missouri River region. The wood has a tendency to warp in seasoning, but this may be overcome by proper methods of piling.

Paper pulp, box boards, backing for veneer, the unexposed parts of furniture, wagon boxes, interior woodwork and boarding, and fuel are the principal products for which the wood is used. The increased value which the tree is gaining for these uses, coupled with the ease and rapidity with which it can be grown, renders it one of the important species for commercial planting in the Middle West. Its fuel value in some regions is especially high, since it furnishes a greater amount of wood in a given time than other species. In proportion to volume the relative heat production is, however, low.

Cottonwood is useful for protecting agricultural lands subject to annual overflow. A narrow belt of trees on the river side of such lands protects the fields from débris and checks the erosive action of the water. Plantations of cottonwood established on land between the river and the levee will not only protect the levee from damage by wave wash caused by the wind, but will also give large commercial returns. It is also particularly adapted for planting along canals, since the roots do not grow into the water.

METHODS OF PROPAGATION.

Cottonwood seeds abundantly and extends itself rapidly over newly made land along rivers. The seed ripens in May or June, and unless it falls on a favorable situation it quickly loses its ability to germinate.

Propagation by seedlings or cuttings may readily be carried on. Large numbers of seedlings annually spring up on the sand bars, where 1-year-old trees for establishing a plantation can be easily and cheaply procured. A plantation may be established rather more cheaply by cuttings than by seedlings. The cuttings should be made from 1 or 2 year old branches of vigorous trees. Cuttings one-half inch in diameter and 18 to 24 inches long are of desirable size for ordinary use. Much larger cuttings, however, can safely be used and are often desirable where the erosion is very severe.

PLANTING.

Seedlings or cuttings of the cottonwood should be set out in the spring as soon as danger from severe frost is past. In the Middle West this time ranges from the latter part of March to the first of May.

Seedlings may be quickly and cheaply planted by a man and a boy working together. With a spade the man makes an opening in the ground into which the boy slips a tree. The spade is then withdrawn and the soil about the tree firmed immediately, before the man advances for the planting of the next one.

Two-thirds of the length of the cutting should be below the surface of the ground, and on the portion above the ground there should be at least two or three good buds.

In planting groves on permanently moist situations the trees should be set 6 to 8 feet apart each way. This gives 1,210 or 680 trees per acre.

CULTIVATION AND CARE.

The growth of the cottonwood is so rapid where conditions are at all favorable that it is seldom, if ever, subject to the crowding or overtopping of less desirable species.

Plantations should not be used for pasturage for at least five years. Grazing animals not only eat the tender shoots and leaves, but expose and cut off the roots by trampling the ground around the trees.

Fire is one of the most serious enemies of this tree, both in planted groves and natural forests. Protection can readily be secured by plowing several furrows around the plantation. If the furrows are kept free from weeds, fire will be effectually kept out. Where this is not possible a path or fire lane entirely surrounding the plantation should be raked free of leaves and débris. In the spring and fall, when the danger from fire is greatest, the plantations should be kept under observation, and all fires should be extinguished immediately.

Approved.

James Wilson,
Secretary.

Washington, D. C., *November 24, 1906.*

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